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TITLE

IMPROVED TELESCOPING STUN GUN

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IMPROVED TELESCOPING STUN GUN

1. **Field.** The present invention relates generally to the field of personal protection devices and more particularly to an improved telescoping stun gun having a handle

5 connected to a rapidly extendable shaft, a power unit connected to shock electrodes at the end of the shaft. The power source also may energize conductive strips along all or a portion of the length of the shaft.

2. **Background.** Over the years a number of hand-held electrical shocking devices (stun guns) have been developed with varying degrees of success. One of the primary
10 drawbacks with such devices is the close proximity that one must maintain an order to subdue an assailant. Conversely, projectile-type devices, while extending the effective “reach” of such devices (although not enough to really matter) are too cumbersome to be comfortably carried or concealed in most self-defense or law-enforcement situations. Projectile-type stunning devices (such as the “TASER”) are tactically limited due to a
15 number of practical considerations not the least of which is their “one shot” or “shallow magazine” nature which precludes their being used against multiple subjects.

 The present invention represents an increase in tactical effectiveness over all other existing stun gun systems. Simple, compact and light weight, the device of the present invention enables the operator to efficiently subdue and incapacitate all but the most
20 heavily armed opposition, irrespective of disparities in relative size, strength or reach. With the device of the present invention, one can favorably resolve a number of situations that might otherwise require the use of lethal force.

 Minimal training is required to become proficient in the use of this invention and the potential civilian, law-enforcement and military applications of the present invention

are numerous. The design of the present invention represents a significant breakthrough in the practical efficiency of personal non-lethal defense weapons.

3. **Summary.** The improved telescoping stun gun of the present invention comprises a self-contained power source such as batteries, electrically connected to a voltage step-up circuit that has an output of stepped-up voltage relative to the power source as in conventional commercially available stun-guns (such as Muscle Man, Omega, Stun Master and Taser). The power source and step-up circuitry are preferably contained in an ergonomically shaped handle for easy and sure gripping. A first tube section is connected to the handle. One or more additional tube sections are disposed more or less concentrically within the first tube section, the smallest being the innermost tube section. The tube sections are preferably multiple sections of interlocking, concentric, thin-walled, rigid, tapered tubes. The tube sections, if placed end to end, form a tapered shaft, tapering from largest near the handle to smallest at the distal end. The smallest tube section includes one or more probes that are electrically connected to the output of the step-up circuit. The tube sections are configured so that if a centrifugal force, such as the flick of the wrist, or other deployment means is applied, the inner tube sections automatically extend and lock into place by a connection means forming a shaft that extends away from the handle. The probe or probes at the end of the smallest tube section are located at the distal end of the entire shaft and can be used to intimidate, shock or warn a potential attacker. Conductive strips, energized by the output of the step-up circuit, may be placed along the shaft to prevent an attacker from grabbing and removing the telescoping stun gun of the present invention from the operator.

The present invention is a vast improvement over conventional stun gun/baton designs. The present invention greatly increases the effectiveness of a high voltage stun gun while maintaining a compact and light weight package when not in use. One of the important features of the present invention is the speed with which it can be deployed,
5 quite literally in the blink of an eye. The almost instantaneous deployment along with anti-grab conductive leads that run along the shaft, make this device difficult to defend oneself from.

The present invention provides increased safety for the operator in greatly extending his or her secure defensive radius as well as the tactical sphere of direct
10 influence. A flick of the wrist instantly deploys the tube sections to form a fully extended shaft having one or more probes or electrodes at the end of the shaft. The probes may extend from the end of the shaft. In an alternate embodiment, the conductive leads may extend to the end of the shaft to serve as the shock delivering electrodes. The rotational energy imparted to the inner (distal when extended) tube sections causes them to snap out
15 and lock in place instantly. The exposed conductive leads along the shaft prevent the operator from being disarmed by an assailant. By grasping the shaft of the present device, an attacker merely facilitates the delivery of the high voltage charge and must either immediately let go of the instrument or be quickly incapacitated. The operator can expand and retract the shaft any number of times to target different specific body areas on
20 one or more assailants.

In an alternate embodiment, the power unit housing may form the handle of the device and be disposed within the extendable shaft at the base of the largest diameter tube section. The electrode probes are mounted on the narrow end of the smallest diameter

(center when retracted) tube section. Wires connecting the power unit to the electrodes must be capable of spanning the entire distance of the extended shaft.

In a preferred embodiment, the present invention is equipped with a retention device to help maintain the retracted position when not in use. When the improved stun
5 gun of the present invention is in the retracted position, the smaller tube sections rest inside one another according to their respective sizes. They are held in the retracted positions inside the largest (base) tube section by any number of retentions means, including, but not limited to, Velcro, internal or external clips, straps, O-rings, or caps. The electrode probes can then be deployed inertially, almost instantly, with the flick of
10 the wrist. In the blink of an eye, the shaft can achieve full extension and lock into place via friction delivering a high voltage charge to a subject before any meaningful reaction can occur. The operator can engage multiple consecutive attackers or discourage further aggression with a display of high voltage arcing from the electrode probes or from the shaft itself. The unit can fire in either the retracted or extended positions.

15 Anti-grab conductive leads consisting of wires, conductive strips, metallic tape, or similar conductive material attached to or embedded in and running along the outside of the shaft prevent the weapon of the present invention from being taken away from the operator. This feature, along with the extreme speed of deployment make effective response to this device very difficult. Deployment itself is essentially frictionless until
20 full extension is reached and the sections lock in place via friction. The smallest diameter end of each tapered tube section captures the largest diameter and of the neighboring (consecutively smaller diameter) tube section, effectively locking up the entire extended shaft. This extremely rapid deployment allows the operator to selectively and accurately

administer a high voltage electrical charge from well beyond arm's length and target specific body areas at their discretion.

Light weight, compact, reliable and extremely effective, the improved stun gun of the present invention enables anyone to quickly subdue and incapacitate all but the most heavily armed opposition, irrespective of disparities in relative size, strength or reach. The present invention also allows the operator to favorably resolve a wide variety of situations that might otherwise require the use of lethal force. The potential applications of the present invention to law enforcement, civilian use (such as animal control) and self defense are virtually unlimited.

Other objects, advantages and capabilities of the present invention will become more apparent as the description proceeds, taken in conjunction with accompanying drawings, in which like parts have similar reference numerals.

4. Brief Description of the Drawings.

Figure 1 shows an improved telescoping stun gun of the present invention in an extended position;

Figure 2 illustrates the improved telescoping stun gun of the present invention shown in Figure 1 in a retracted position;

Figure 3 illustrates an alternate embodiment of the improved telescoping stun gun of the present invention in an extended position;

Figure 4 illustrates an alternate embodiment of the improved telescoping stun gun of the present invention in an extended position;

Figure 5 illustrates the improved telescoping stun gun of the present invention shown in Figure 4 in a retracted position;

Figure 6 illustrates a side view a preferred embodiment of the improved telescoping stun gun of the present invention attached to a riot shield and in a retracted position;

Figure 7 illustrates a side view of a preferred embodiment of the improved telescoping stun gun of the present invention attached to a riot shield in an extended position; and

Figure 8 illustrates an alternate embodiment of the improved telescoping stun gun of the present invention.

5. Detailed Description.

Referring to Figures 1 – 3, a preferred embodiment of the present invention 1 comprises an extendable shaft 2 connected at one end of the extendable shaft 2 to a handle 3. An opposite end of the extendable shaft 2 includes one or more electrical probes 4 for delivering a high-voltage charge to an attacker. The handle 3 houses a voltage step-up circuit 5 electrically connected to batteries or other power source 7 to provide a high voltage output relative to the power source 7. The output of the step-up circuit is electrically connected to the one or more probes 4. This circuitry is similar to those used in stun-guns and need not be discussed herein in detail. Preferably, the step-up circuit 5 and power source 7 can be arranged to fit into an ergonomic handle 3 for ease of gripping and use. In an alternate embodiment, discussed herein, step-up circuit 5 and power source 7 can be disposed in other portions of the present invention 1 eliminating

the need for a separate handle 3. It should further be noted that virtually any type of device capable of delivering an electrical charge, existing or the product of future development, might be adapted for use in the present invention 1.

The extendable shaft 2 preferably is comprised of a series of rigid, concentric, tubes sections, first tube section 2a, second tube section 2b, third tube sections 2c and fourth tube section 2d. First tube section 2a is preferably connected at its base 8 to the handle 3. Preferably, each tube section is tapered so that the interior diameter of the distal end (relative to the handle 3) of first tube section 2a is slightly smaller than the exterior diameter of the proximal end of second tube section 2b and so forth. Although four tube sections are shown in the preferred embodiment, as few as two tube sections may be used in order to create an extendable shaft 2. Moreover, the tube sections need not have a taper over the entire length of each respective section. Rather a taper at or near each end of each tube section would suffice.

The tapered tube sections 2a, 2b, 2c, and 2d may be made of any suitable material including, but not limited to, wound filament fiberglass, PVC, high impact plastic, polycarbonates, or composites. With the proper electrical insulation, materials such as aluminum, carbon fiber, brass, copper, and other electrically conductive materials may be used. The tube sections 2a, 2b, 2c, and 2d fit loosely inside each other according to their respective sizes with 2a being the outermost section. The tube sections 2b, 2c, and 2d can be instantly deployed with any suitable deployment means such as a spring and trigger mechanism, CO₂ power, or compressed air. However, the preferred means of deployment, and an important feature of the present invention 1 is to use centrifugal force with a flick of the wrist. Extension is essentially frictionless until full deployment is

almost reached and the tube sections 2b, 2c, and 2d lock into place by the friction encountered from the snug fit caused by the taper of the tube sections 2a, 2b, 2c, and 2d. Prior devices have contained too many components, causing the prior devices to be too heavy to carry for self-defense purposes. Excessive components in prior devices also have created problems with maintenance in the event one of the numerous components happens to break or fail.

It should be noted that the number of tube sections may vary widely as can the degree of taper used for each tube section. The preferable taper for the tube sections is one inch in diameter for three feet of length. Tube sections can be of such dimension that if placed end-to-end, largest to smallest, the ends of each will line up with that of its neighbor. In other words, the tube sections could be cut from the stock from a single mandrel. Many variations in the number, length, thickness, diameter, cross-sectional shape, size and taper of the tube sections can be used and still work properly and effectively.

The inner (when retracted) tube sections 2b, 2c and 2d of the shaft 2 may be retained in the first tube section 2a by any number of retention means to prevent accidental deployment. The retention means include, but are not limited to, an end cap 25 that is attached at or near the distal end of tube section 2d and sized so that it fits snugly within tube section 2a, but not tight enough to prevent deployment. It should be apparent to anyone skilled in the art that any number of systems can be employed for preventing accidental deployment including, but not limited to, O-rings, spacers, magnets, Velcro, clips, tapered plugs, or straps. The end cap 25 also may be eliminated completely allowing the shaft sections to float freely.

Preferably, the distal end of the tube section 2d contains probes 4a and 4b for delivering a shock to an assailant. The probes 4a, 4b are electrically connected to the output of the step-up circuit 5 preferably by internal wiring 11. The wiring 11 can be coiled, placed in a spring loaded spool, or remaining loose depending on many variables
5 such as the length of the overall extendable shaft 2. The wiring 11 must be of sufficient length to span the entire distance of the shaft 2 when the device of the present invention 1 is deployed. The probes 4a and 4b may be arranged in any number of configurations which may be useful for various self-defense purposes. For example, the probes may be parallel or be tilted toward or away from each other. In certain configurations, the probes
10 may visibly display the arcing for intimidation purposes or for a warning. In other configurations, the visible arcing may be eliminated. The probes also may be sharpened to facilitate the penetration of heavy clothing.

Conductive leads 12b, 12c, and 12 d and 13b, 13c and 13d, may be attached to or embedded along the tube sections 2b, 2c, 2d. The conductive leads are arranged so that
15 the conductive leads at the distal end of tube section 2b electrically connect to the conductive leads at the proximal end of tube section 2c and so on. Direct connection is not crucial as the high voltage delivered by the present invention 1 can easily jump gaps. The conductive leads all are electrically connected to the output of the step-up circuit 5 either directly or indirectly through a connection to the probes 4a, 4b. The conductive
20 leads are comprised of an exposed metal or other electrically conductive strip that acts as an anti-grab mechanism. The conductive leads deliver a high voltage shock to anyone who attempts to grab the shaft 2 of the present invention 1. The number and arrangement of conductive leads can vary. For example, the conductive leads may be arranged around

the shaft spirally, in a criss-cross pattern or in any other pattern to facilitate and effect of delivery of a high voltage shock to anyone attempting to grab the shaft 2 of the present invention 1.

An on/off switch 9 and trigger 10 can be mounted in any convenient position on
5 the handle 3. However, the switch 9 and trigger 10 are preferably mounted either together or on opposing sides of handle 3. In a preferred embodiment, the on/off switch 9 arms the present invention 1 and must be turned on to achieve the stepped-up voltage at the output of the step-up circuit 5. The trigger 10 is depressed by a user to send the high voltage to the one or more probes 4 that are electrically connected to the output of the
10 step-up circuit 5 and the conductive leads.

Figures 4 and 5 illustrate an alternate preferred embodiment of the present invention 1. In this embodiment, the handle 3 is eliminated. The step-up circuit 5 and batteries 7 are disposed within and near the base 8 of the first tube section 2a to allow the additional tube sections 2b, 2c, and 2d to be contained within the first tube section 2a
15 when in the retracted position. The switch 9 and trigger 10 are mounted on the side of the tube section 2a. The tube section 2a effectively serves as the handle in this alternate preferred embodiment of the present invention 1.

In a particularly preferred embodiment, the internal wires 11 may be eliminated to create a “wireless” extendable stun gun 1 of the present invention. In this configuration,
20 one or more of the conductive leads 12a, 13a may be directly electrically connected to the output of the step-up circuit 5. At the distal end of the shaft 2, the conductive leads 12d, 13d are connected to the probes 4a, 4b. Therefore, once the shaft 2 is fully extended, and the conductive lead 12a is electrically connected to 12b and so on, the probes 4a and 4b

are “hot” when activated by the switch 9 and trigger 10. To insure a consistent electrical connection through the entire length of shaft 2 to the probes, it is preferable to use four or more conductive leads per tube section. In an alternate embodiment of the preferred “wireless” stun gun, the step-up circuit 5 and power source 7 are located in the tube section 2d and wired directly to the probes. The circuitry may be switched and triggered using any known means.

Figures 6 and 7 illustrate a second alternative preferred embodiment of the present invention 1. In this embodiment, the improved telescoping stun gun of the present invention is mounted to a riot shield 27. Preferably, the improved telescoping stun gun of the present invention 1 is rotatably mounted to the riot shield 27. The riot shield 27 also preferably contains a recessed pocket 29 which serves as a cradle for the stun gun of the present invention 1 in its fully retracted position as shown in Figure 6. The base 8 of the first section 2a is attached at the lower portion 31 of the pocket 29. Any number of configurations may be used to rotatably attach the stun gun of the present invention 1 to the lower portion 31 of the pocket 29. For example, the stun gun of the present invention 1 may be attached to the lower portion 31 of the riot shield 27 by an axle or with ball and socket arrangement.

In a particularly preferred embodiment, a coiled spring 37 is connected both to the lower portion 31 of the riot shield 27 and the base 8 of the first tube section 2a. The spring 37 is attached so that the spring 37 is exerting pressure when on the base 8 of the first tube section 2a when in the retracted position. A locking mechanism 39 maintains the stun gun 1 in its retracted position until the operator is ready to deploy the stun gun 1. Preferably, the batteries 7 and step-up circuit 5 are attached on the operator side 33 of the

riot shield 27. The power switch 9 and trigger 10 along with the release buttons 35 are attached to the handles of the shield for easy access by the operator. By depressing a release button 35, the spring 37 forces the stun gun 1 to rotate downward and at the same time imparts sufficient centrifugal force to cause the tube sections 2b, 2c, and 2d of the
5 stun gun 1 to deploy and lock into place as shown in Figure 7. The operator can arm and use the stun gun of the present invention by means of on/off switch 9, and fire trigger 10. The electrical circuitry of the stun gun of the present invention 1 may be configured so that the shaft is instantly charged when deployed with no further action on the part of the operator.

10 In an alternate preferred embodiment of the present invention 1, Figure 8 illustrates a power unit 21, comprising a step-up circuit 5 and the batteries 7, as detached from the extendable shaft 2. In this configuration, the operator may carry the power unit 21 on a belt pack, back pack or similar arrangement. Wires 30 connect the power unit 21 to the stun gun of the present invention 1. This configuration allows the stun gun of the
15 present invention to have a larger power source 21 to deliver a larger voltage or amperage and also gives the power unit an extended charge life.

It should be appreciated that the illustrated and described embodiments are examples and not limitations on the present invention. The variations and other embodiments are defined by the scope of the following claims.